

CLAIMS

1. An inflator comprising:
an inflator body;
a substantially cylindrical booster cup extending in said body, said booster cup
5 having an outer peripheral wall and an end surface extending radially inwardly from
said wall;
a plurality of apertures formed in said outer peripheral wall;
a first propellant charge positioned in said booster cup;
a second propellant charge positioned in said inflator body;
10 an initiator assembly operable to activate said first propellant charge, wherein
a combustion thereof initiates a combustion of said second propellant charge and
ejection of an inflation gas from said inflator body.
2. The inflator of claim 1 wherein said inflator body comprises an inner
15 peripheral wall separated from said outer peripheral wall by a substantially annular
space; and
said second propellant charge is positioned in said space.
3. The inflator of claim 2 wherein said second propellant charge is positioned
20 substantially adjacent said outer peripheral wall.
4. The inflator of claim 3 wherein said second propellant charge comprises a
plurality of propellant tablets.
- 25 5. The inflator of claim 3 wherein said second propellant charge substantially
fills the space between the outer peripheral wall and the inner peripheral wall of the
inflator body.
6. The inflator of claim 5 comprising a filter constraining said second propellant
30 charge in said space.

7. An inflator for an inflatable restraint system in a vehicle comprising:
 an inflator body having first and second ends and an inner peripheral wall;
 a booster cup extending in said body and having an outer peripheral wall and
 an end surface extending inwardly from said outer peripheral wall, said booster cup
 5 having a first propellant charge positioned therein;
 said inner peripheral wall and said outer peripheral wall are separated by a
 substantially annular space having a second propellant charge positioned therein;
 an initiator assembly disposed proximate said first end and operable to ignite
 said first propellant charge; and
 10 a nozzle positioned at said second end of said body and defining a nozzle
 outlet for supplying an inflation gas to the inflatable restraint system.

8. The inflator of claim 7 comprising a filter positioned adjacent said end
 surface.

9. The inflator of claim 8 wherein said body has a total length and an area
 defined by a cross-section thereof, and said filter has a given length about one-fourth
 to one-half of the total length of the body, said filter occupying a volume determined
 by multiplying the cross-section of said body by the length of said filter.

10. The inflator of claim 7 wherein said booster cup is a substantially cylindrical
 elongate member substantially coaxial with said inflator body.

11. The inflator of claim 10 wherein said booster cup includes a plurality of
 25 apertures formed in said outer peripheral wall.

12. The inflator of claim 11 wherein said substantially annular space extends
 longitudinally in said inflator body from a point proximate said first end up to a point
 substantially coplanar with said end surface.

13. The inflator of claim 8 wherein said filter is substantially cylindrical and
 includes a substantially cylindrical periphery positioned adjacent said inner peripheral
 wall, and a substantially planar end positioned flush with said end surface.

14. An inflatable restraint system for a motor vehicle comprising:
an inflatable restraint device;
an inflator operable to provide an inflation gas to said inflatable restraint
5 device, said inflator comprising an elongate substantially cylindrical inflator body
having first and second ends and an inner peripheral wall;
an elongate combustion cup mounted to said inflator body proximate said first
end and extending substantially coaxially therewith, said combustion cup having an
outer peripheral wall separated from said inner peripheral wall by an annular space,
10 and a plurality of apertures formed in said outer peripheral wall;
a propellant charge positioned in said space;
a filter in said inflator body and securing said propellant charge in said space;
a nozzle member proximate said second end of said inflator body, said nozzle
member constraining said filter against axial displacement.
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15. The inflatable restraint system of claim 14 wherein said propellant charge
comprises a plurality of gas generant tablets positioned in a geometrically ordered
fashion in said annular space.
- 20 16. The inflatable restraint system of claim 15 wherein said propellant charge
comprises a plurality of gas generant tablets stacked adjacently in said annular space
and having cylindrical axes oriented substantially perpendicular said inner peripheral
wall.
- 25 17. The inflatable restraint system of claim 14 wherein said nozzle is threadedly
engaged with said inflator body.
18. The inflatable restraint system of claim 14 wherein said filter is secured
against said booster cup, thereby constraining said tablets from movement in said
30 annular space.
19. The inflatable restraint system of claim 14 further comprising a propellant
charge positioned in said combustion cup.

20. The inflatable restraint system of claim 14 further comprising an initiator body within said inflator body proximate said first end;

wherein said combustion cup is attached to said initiator body and suspended therefrom, said combustion cup supported in said inflator body solely by said
5 attachment with said initiator body.

21. The inflatable restraint system of claim 14 wherein the inflatable restraint device is an airbag.

10 22. The inflatable restraint system of claim 14 wherein the inflatable restraint device is an airbelt.

23. An inflatable airbelt system for a motor vehicle comprising:
an inflatable airbelt;

15 an inflator operable to provide an inflation gas to said airbelt, said inflator comprising an inflator body and a booster cup extending in said body, said booster cup having an outer peripheral wall and an end surface extending radially inwardly from said wall;

said booster cup includes a plurality of apertures formed in said outer
20 peripheral wall;

a first propellant charge positioned in said booster cup;

a second propellant charge positioned in said inflator body;

an initiator assembly operable to activate said first propellant charge, wherein a combustion thereof initiates a combustion of said second propellant charge via said
25 apertures.

24. The airbelt system of claim 23 wherein said booster cup is an elongate substantially cylindrical member oriented substantially coaxially with said inflator body.

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25. The airbelt system of claim 24 wherein said inflator body includes an inner peripheral wall spaced from said outer peripheral wall of said booster cup by an annular space;

said second propellant charge positioned in said space.

26. The airbelt system of claim 23 comprising a filter constraining said second propellant charge in said space.

27. An inflator module for a vehicle occupant protection system comprising:
5 a module housing;
an inflator positioned in said housing, said inflator comprising a combustion cup mounted to said inflator body and extending substantially coaxially therewith, said combustion cup having an outer peripheral wall partially defining an annular space and a plurality of apertures formed in said outer peripheral wall;
10 a propellant charge positioned in said space;
a filter in said inflator body and securing said propellant charge in said space.

28. The inflator module of claim 27 wherein said inflator comprises an inflator body having an inner peripheral wall opposing said outer peripheral wall, said inner
15 and outer peripheral walls defining said space.

29. The inflator module of claim 28 wherein said inflator includes a filter member positioned adjacent said combustion cup and constraining said propellant charge in
20 said space.

30. A method of manufacturing a gas generator comprising the steps of:
positioning a combustion cup within an elongate substantially cylindrical inflator body;
placing a propellant charge in a space extending between an outer peripheral
25 wall of the combustion cup and an inner peripheral wall of the inflator body;
inserting a filter member into the inflator body up to a point at which the filter bears against an end surface of the combustion cup; and
positioning a nozzle member in the inflator body at a selected axial position
such that the filter is constrained from axial movement between the nozzle member
30 and the combustion cup, whereby the filter secures the propellant charge in the space.

31. The method of claim 30 wherein the step of placing a propellant charge in the space comprises placing propellant tablets therein.

32. The method of claim 31 wherein the step of placing the propellant charge in the space comprises placing the propellant tablets therein in a geometrically ordered fashion up to a point substantially coplanar with an end surface of the combustion cup.

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33. The method of claim 30 wherein the filter length is sized to reduce or increase a gas pressure resulting from activation of the gas generator.

34. A gas generator manufactured according to the method of claim 30.